

## **COLLABORATIVE WORKING IS DRIVING PROGRESS IN HAZARD AND RISK REDUCTION DELIVERY AT SELLAFIELD-16387**

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### **ABSTRACT**

A new way of working has been adopted at the Sellafield site in the United Kingdom which is delivering benefits in terms of accelerating hazard and risk reduction safely and securely at the site. This new way of working involves a collaborative approach on crucial aspects of the plan of work for Sellafield between:

- Sellafield Ltd (the site's management and operations contractor),
- The Nuclear Decommissioning Authority (the site's owner and Sellafield Ltd's customer)
- The Office for Nuclear Regulation (the UK's nuclear safety and security regulator)
- The Environment Agency (England's environmental regulator)
- The UK Government's Department of Energy and Climate Change
- The UK Government's Shareholder Executive, part of the Department of Business, Innovation and Skills

The new way of working is founded upon fully aligning the individual strategies of each of these six organisations towards the common goal of accelerated risk and hazard reduction and then ensuring good communications so these strategies remain fully aligned.

To this end a number of issues were identified by the six organisations which were considered to be slowing the progress of the risk and hazard reduction work, from which a set of "strategic themes" was developed to facilitate different ways of thinking and so solve these issues.

The strategic themes are:

- Looking for blockers and how they can be removed
- Avoiding overly complex solutions by utilising the concept of fit for purpose
- The effective use of resources
- Prioritisation arrangements
- Incentivisation
- The appetite for risk
- Avoiding distractions and diversions

- Effective use of communications so that the more effective and efficient ways of working, and the improvements that are generated, are promulgated throughout Sellafield Ltd

These strategic themes have been applied with great effect in a number of areas delivering risk reduction benefits. For example:

- The removal of ageing fuel from Sellafield's oldest pond, the Pile Fuel Storage Pond; a significant milestone in the site's hazard and risk reduction agenda.
- Implementing an alternative ILW approach.
- Managing stocks of Highly Active Liquor (HAL).
- "Re-purposing" existing Waste Management Facilities.

## **INTRODUCTION**

Sellafield in Cumbria ranks as one of Europe's largest industrial complexes, storing more radioactivity in one location than probably any other nuclear facility in the world. The origins of the site (1947) are founded firmly in supporting UK's defence priorities, before evolving into the development of commercial scale nuclear power programmes and the provision of nuclear fuel cycle services to a broad range of international and domestic customers.

Given the age and requirements of many of the facilities on this complex site, the delivery of Risk Reduction and Hazard Removal (RR&HR) is a UK national priority. As such, RR&HR requires a number of separate organisations to work effectively together to achieve progress.

In 2014, a new way of collaborative working was developed by the key RR&HR stakeholders for the Sellafield site. This new way of working involves, and requires, collaboration on crucial aspects of the plan of work between:

- Sellafield Ltd (the Site Licence Company)
- The Nuclear Decommissioning Authority (NDA)
- The Office for Nuclear Regulation (ONR)
- The Environment Agency (EA)
- The UK Government's Department of Energy and Climate Change (DECC)
- The UK Government's Shareholder Executive (ShEX, part of the Department of Business Innovation and Skills)

This way of working amongst these six key organisations has become known as "G6".

## **THE ESSENCE OF G6**

An initial review of the individual organisation's corporate strategies readily identified RR&HR at Sellafield to be an important common goal, reflecting the work's status as a national priority. However, applying these strategies individually was not delivering progress at the rate desired.

At the initial meeting to establish the G6 'mechanism', all parties resolved to work together towards the common goal of accelerated risk and hazard

reduction at Sellafield. To this end a number of issues were identified by the six organisations which were considered to be slowing the progress of the risk and hazard reduction work, from which a set of "strategic themes" was developed to facilitate different ways of thinking and so solve these issues.

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These strategic themes serve to provide the necessary structure for collaborative working when addressing specific areas of the RR&HR programme. In essence the question asked is "what is preventing or inhibiting really great progress in RR&HR at Plant X or for Project Y" and then working together to overcome the obstacles identified. This new approach requires the six organisations to engage in realistic and collaborative dialogue to fully understand the issues that need to be resolved, and then take effective, coordinated action to ensure accelerated RR&HR is achieved in practice.

A key feature of the G6 is its voluntary nature. All the member organisations have independent legal duties and responsibilities and it is crucial to the approach that these are not diluted or infringed through participation in the G6 process. As such, the G6 has no chair, but instead provides a collaborative forum through which blockers can be identified, issues discussed and initiatives sponsored and encouraged in the interests of expedient RR&HR at Sellafield.

## **OVERVIEW OF THE G6 STRATEGIC THEMES**

### **(a) Prioritisation**

The overall Sellafield programme of work extends until 2120, and addresses the full scope of activities envisaged for the site to deliver the anticipated end state at that time. A near term view is produced under the national arrangements established by NDA.

The scheme for prioritisation takes account of a number of factors including risk and hazard, together with deliverability issues and maintaining strategic coherence with the NDA national strategy.

The six G6 members, by virtue of their differing remits, all have slightly different views on how elements of this work programme should be

prioritised. This strategic theme therefore exists to challenge and confirm that alignment on priorities is maintained at a more detailed tactical and delivery level within the RR&HR programme.

For understandable reasons there are often short-term or immediate potential conflicts of priority that can arise, or be perceived at a more detailed level. By applying this theme points of conflict are examined constructively and collaboratively and the necessary actions agreed to resolve the issues and so ensure the RR&HR work proceeds efficiently.

(b) **Blockers and Bureaucracy**

Over the years, large organisations tend to develop a wide range of processes and procedures as part of their management systems. The nuclear industry in general and more specifically Sellafield is no exception to this. However, a number of procedures and processes that are fully appropriate in the course of "normal business" have proved not to be fit for purpose when applied to Sellafield RR&HR. For instance they drive over-complex solutions or create significant delays in addressing urgent risk reduction tasks. This strategic theme therefore seeks to drive essential simplifications and focus into areas of the management systems of the G6 organisations so that these are better aligned to the RR&HR work.

(c) **Distractions and Diversions**

In the course of managing a complex site such as Sellafield the propensity for distraction of the teams engaged on the urgent mission of delivering hazard and risk reduction can be quite significant. This strategic theme specifically recognises the need to minimise the impact of external issues on the work of these teams. Each of the G6 organisations has the ability to distract and divert the others from the RR&HR task, so collaboration and cooperation in this area is essential.

(d) **Incentives and Disincentives**

This is a broad ranging theme which covers aspects such as the fundamental model of shareholding for Sellafield Ltd, through to task-level arrangements for doing work. The strategic theme considers whether the way work is governed, managed, rewarded etc is more or less likely to encourage the RR&HR programme. Where a disincentive to progress appears likely, action is taken to offset its effects. This strategic theme has wide applicability to all G6 members, and aims to avoid decisions taken in isolation by individual organisations from having unintended consequences on the wider RR&HR agenda.

(e) **Fit for Purpose**

The nuclear sector applies decades of engineering and technical experience to achieve some of the highest standards of performance, reliability and safety of any industry. The standards are particularly exacting given that

risks need to be maintained at very low levels throughout the operating lives of facilities, which in most cases are designed to operate for several decades. Achieving such high standards is however necessary and justified given the safety and economic consequences of a major nuclear accident.

This heritage can however represent a significant obstacle to delivering timely RR&HR progress. Where overly elaborate solutions are deployed as a result of “traditional thinking” it is frequently the case that equipment becomes harder to design, takes longer to build and ultimately proves too complicated to operate. All these factors serve to delay the RR&HR work. Perversely, standards and approaches designed to reduce risks end up doing the opposite because of the additional time at risk that results from such delays.

This strategic theme therefore aims to challenge inappropriate design and engineering paradigms. For instance, does equipment that is only needed for a few years (or perhaps less) need to be designed to the same standards and codes as equipment that will need to operate fault-free for decades? Similarly, can extra design time intended to produce marginal (e.g. a few %) reductions in already low risks be justified given the magnitude of the prevailing risks from delayed retrievals? Similar questions can also be posed in regard to operational aspects.

The level of effort that needs to be invested here to facilitate and sustain fit for purpose approaches is significant given the decades spent working to former paradigms. Conversely though, there are also considerable challenges in ensuring that standards are not relaxed too far – fit for purpose will not always be about lower standards, but is instead about setting the right standards for the circumstances.

(f) **Effective use of Resources**

An overarching consideration is the need to make good use of available resources, whether these be human, capital, facilities or equipment. As a direct outcome from pursuing the strategic themes listed above, new opportunities to do work more effectively, and so accelerate the site’s RR&HR programme, are being identified. As an example, a case study describing the “re-purposing” of some waste handling facilities at Sellafield will be presented later in this paper.

Effective use of resources has proved to be beneficial to other G6 parties too. For instance, ONR has re-designed its regulatory approach to Sellafield, adopting new ways of working to deliver a significantly more effective approach which at the same time utilises reduced inspectorial resource.

(g) **Risk awareness and appetite**

A necessary, but undesirable consequence of the RR&HR work is that an increase in short term risks is invariably necessary in order to achieve a

longer-term permanent reduction in risks and hazard. Communicating what the prevailing risk levels mean in practice and how these are predicted to change during various phases of the work is unfortunately notoriously difficult to achieve effectively, especially with non-technical audiences. This strategic theme has therefore developed a risk landscape framework which is proving a useful tool to guide important considerations in the area. This is described later in the paper.

For example, the tool is being used to help G6 members and other stakeholders to determine their level of "risk appetite". Risk appetite is an appreciation by individual stakeholders of how much risk they consider to be acceptable (against the backdrop of the prevailing risks from not proceeding) in order that RR&HR is achieved. Advance consideration of risk appetite is a critical activity for all the G6 members in formulating policies, in tactical and strategic decision-making as the work proceeds and in preparing for the possibility of incidents and events. In the last of these, the absence of advance thinking in regard to risk appetite, or failures to communicate this effectively to interested parties, could readily lead to an over-reaction by one or more stakeholders and the RR&HR work being halted unnecessarily.

#### (h) **Communications**

From the outset the importance of establishing and sustaining effective communications was recognised as a key strategic theme in its own right. This theme provides the channel to inform, share, encourage and sustain RR&HR delivery at Sellafield, whilst taking account of the G6 organisations' differing, but compatible accountabilities. Outputs include Case Studies which have been made widely available within Sellafield Limited, in order to encourage emulation, further innovation and to recognise successes. A routine discussion between all the G6 organisations' communications professionals has also been set up to maintain an up to date perspective on progress. In addition, a "best practice" Conference was held in 2015 and 44 potential projects were judged against the strategic themes to identify excellence in the application of the G6 ethos at Sellafield. Continuing communications will enhance the visibility, effectiveness and appetite to deliver visible hazard and risk reduction progress.

### **RISK LANDSCAPE FRAMEWORK**

In the world of mainstream nuclear operations, the goal is to operate reliably, predictably and conservatively – e.g. well within the margins of the safety case. At Sellafield there are over 200 operational nuclear facilities and the vast majority are comparable with nuclear facilities elsewhere. There are however, a small number of facilities – known as Legacy Plants, where the combination of ageing, inventory, the absence of designed provisions for retrievals and difficulties in providing viable technical and engineering solutions has led to an urgent focus on RR&HR. As noted already, different thinking is now needed to

address the inherent challenges and their urgency. Accordingly a risk landscape framework, see fig 1 below, has been developed to help communicate an understanding of the relative risks, and to encourage and catalogue appropriate arrangements requisite for the inherent demands of the specific framework regions.

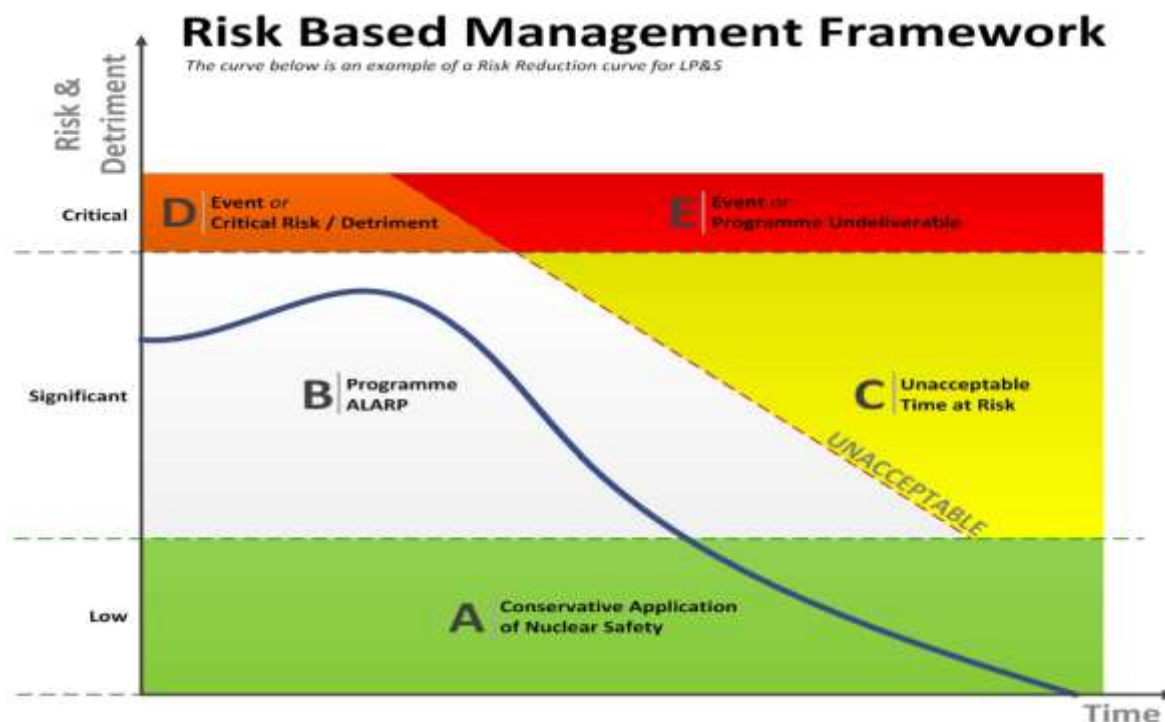
### **Sellafield Ltd Approach to Managing Risk and Determining Risk Appetite**

The Sellafield Site is a complex and interdependent mixture of operating nuclear facilities, ageing waste stores, waste treatment facilities, redundant facilities in a care and surveillance regime, and significant new build projects. The new build projects are to provide the capability to process the wastes currently stored, and those to be generated during broad-front decommissioning, which will ultimately reduce the risk that the site poses.

All of these different programmes and operations present differing levels of baseline and transient risk. For example a newer reprocessing plant has the engineered and physical structures to minimise nuclear risk and, due to the nature of its operations can move to a quiescent safe state by stopping production. In contrast, the Legacy Plants lack modern engineered controls, are ageing in physical robustness and do not have the ability to become quiescently safe (as a storage facility cannot stop production).

Deriving the baseline risk for each programme/facility on the site allows the Sellafield Ltd Board to determine its the risk appetite. It allows the organisation to prioritise resources on a risk basis. Giving visibility of the baseline risk position enables informed management decisions which are aligned, through the same mechanism, to the risk appetite set by the Board.

The diagram below presents a simple framework, with increasing risk on the y (vertical) axis and time on the x (horizontal axis); the framework allows the current and future risks for a programme/facility to be put into context in one of five identified regions.



**Figure 1: The Model**

*Region A:*

A programme or facility which sits in Region A cannot change its broad risk levels nor breach its pre-defined acceptable risk provided its safety continues to be managed appropriately. For example a modern reprocessing facility such as THORP could run indefinitely within its justified safety case provided it is properly operated and maintained within this envelope. Prolonged operations (within the reasonable timescales of this model) do not represent any particular increase in risk. The only route to the risk increasing out of Region A is on the vertical axis, i.e. by failing to operate or maintain the plant within its safe envelope. This is avoided by applying standard safety management processes - these protect the boundary between Regions B and A. Moving to the right in the diagram (i.e. going forwards in time) no region boundaries are encountered and hence business delivery and safety management processes can be considered separately.

A programme or facility which sits in Region A is one in which the potential impact on any critical group is less than a prescribed level (e.g. 10mSv) and the facility can be made quiescently safe by stopping production (etc) operations.

*Region B:*

Facilities or programmes in Region B represent significant but not extreme risks. Significant risks are usually interpreted as those exceeding ONR's



tolerable risk thresholds as set out in its Safety Assessment Principles (see paras 695ff of [www.onr.org.uk/saps/saps2014.pdf](http://www.onr.org.uk/saps/saps2014.pdf)).

In Region B the baseline risk can increase by undertaking transient work, or by extending the time for which the risk exists. The boundaries to Regions D and C are set by the programme ALARP safety case (i.e. the justification that the risks satisfy the UK legal requirement to be As Low as Reasonably Practicable and meet Sellafield Limited's risk policy criteria for extreme risks). More importantly the issues associated with approaching region D or moving closer to C are also a vital part of the ALARP governance arrangements. The safety management arrangements need therefore to cover variation upwards and also to the right. There is limited compromise in A. B is about significant compromise. A is about meeting standards, B is about fit for purpose. A is about facility and project safety cases. B is about overall lifetime ALARP.

A facility or programme in Region B presents a significant risk to a critical group that cannot be removed by stopping production. Such situations therefore need a credible, funded and time-based plan in place to bring the risks into Region A quickly and effectively.

#### *Region C:*

In order for a facility or programme to be in Region C it has to have met the criteria for Region B and in addition

- there is no credible plan in place for the RR&HR work,
- or the plan in place has been subject to delays that have moved it beyond strategic tolerances,
- or the risk has increased due to a transient change. Such transient increases might arise from, for example:
  - an event on the plant
  - changes in operational circumstances necessary for remediation work (e.g. the need for a crane to be installed close to the plant) or
  - because of a credible threat which increases the security derived risk.

#### *Region D*

Region D covers programmes and facilities where there is a critical risk or detriment that makes the risks "extreme". Extreme risks lie outside of transitory risk tolerance agreed for the facility or programme. This might have occurred for example when local changes in support or changes in strategy have impacted on the deliverability of the plan or a genuine emergency has occurred that has a wide site or off site impact.

Situations in Region D require emergency type measures to bring the risks back under control. They may involve a release of radioactivity, but falling short of a level where the plants cannot be recovered.

### *Region E*

Region E is the most significant region on the model. Like Region D, the risks here will have increased to an extreme level; however now the plans are not considered to be recoverable. Reasons for entering Region D might include a significant change in policy or strategy from outside Sellafield Limited, or a catastrophic event with a significant release of radioactivity.

So while having an emergency event is a potential route into Regions D or E, it is also possible to stray into these Regions through mismanagement of risk and poor behaviours in prioritisation. The framework provides visibility of the impact of these kinds of decisions.

### **Application**

This framework makes it very clear that there is no single “universal” approach to safety, environmental and security management decision making. This is unsurprising on a complex and diverse site such as Sellafield. The framework is used in the following areas:

#### **Defining Risk Appetite**

Placing a programme or facility within the framework as a baseline position provides Sellafield Ltd and the other G6 organisations with clear visibility of the RR&HR plan, its delivery schedules and the consequences of any decisions to change or influence these. Importantly, the acceptability of this plan can be clearly referenced through the associated approvals for resources and funding, and so inform regulatory approaches and other considerations of the G6 organisations.

For facilities in Regions B and C there is greater visibility of the progress of delivery of hazard and risk reduction objectives over time.

This framework also impacts on the management system and other strategic themes, e.g. fit for purpose solutions, for programmes and facilities outside Region A. Specifically, it formalises the adoption of appropriate approaches to managing issues that are adapted from standard (Region A) approaches in a manner that is clearly informed by, and congruent with the urgency of action necessary given the prevailing risks. In addition proportionate Region-informed responses are demanded from other functional support areas within the Sellafield Limited. There is a clear parallel expectation of compatible responses from the other G6 organisations.

### **HOW G6 WORKS**

The structure of G6 is essentially very simple both in concept and functionality. Senior representation from each organisation meets quarterly at a Forum. The purpose is to promote and encourage effective collaborative working between

the organisations and to guide the work of the “Engine Room” (see below), aligned to the common purpose of achieving accelerated hazard and risk reduction at Sellafield.

The key functions are:-

- To establish a G6 Strategic Overview of the key areas which can be developed and exploited in order to accelerate RR&HR at Sellafield.
- To promote and actively encourage collaborative working between G6 organisations aligned to the common purpose, thereby facilitating a more co-ordinated approach to complex issues where interaction may involve a broad range of important and influential bodies.
- To provide challenge, advice and support to the work of the G6 Engine Room, in order to maximise the potential benefits to accelerated RR&HR at Sellafield.
- To provide the Forum where common positions on matters of strategy and policy can be enhanced to improve potential delivery of accelerated RR&HR at Sellafield.
- To work collaboratively as facilitators to support national effective decision-taking aligned with the RR&HR priorities at Sellafield.
- To provide the G6 Engine Room with an escalation route for issues that cannot be resolved at the working level.
- To encourage timely and regular reporting of progress of RR&HR at Sellafield, and to share the key learning with key stakeholders including the UK Government.

There is a jointly shared expectation that G6 organisations will proactively and widely communicate the ethos and achievements that this collaborative working delivers.

The main work of G6 is done within an “Engine Room”, again comprising staff from each of the G6 organisations. The Engine Room meets monthly and sustains the day to day delivery of work under the “G6 umbrella”, and provides support, encouragement and recognition of successful progress and delivery.

Both the Forum and Engine Room operate on a collaborative, voluntary basis and are expected to visibly demonstrate the G6 ethos in the conduct of business.

## **G6 ACHIEVEMENTS**

Since the inception of this new approach in 2014, significant benefits have been delivered in respect to key RR&HR programmes at Sellafield. A number of specific “Case Studies” are described below.

## **Export of Canned Fuel**

One of the legacy facilities at Sellafield is the Pile Fuel Storage Pond built as part of the UK's initial defence programme (circa early 1950's). It contained a significant inventory of radioactive materials in many different forms including irradiated fuels and isotope cartridges, together with substantial quantities of Intermediate Level Waste (ILW) in solid form and as sludges.

A major step in the risk reduction profile for this facility was delivered by removal of the quantities of all the canned fuel (arising from the UK's reactor design developments programme) into more modern storage facilities on the Sellafield site.

The G6 ethos made significant contributions to the successful delivery of this important risk reduction milestone. A number of organisations had to work collaboratively to support the common goal of canned fuel removal.

The fuel removal route involved recovery from existing storage location, transfer to hot cells, sorting and repackaging, confirmation of inventory and onward transfer into modern storage.

The main G6 contributions were under the strategic themes of effective use of resources (including site facilities and personnel inside and beyond Sellafield Ltd) and prioritisation to deliver this risk reduction expediently and efficiently. Specifically, during the course of the retrievals work, operational issues arose with the reliability of key equipment. Fit for purpose solutions (i.e. to cover the duration of the retrievals programme) were however implemented with full regulatory support and so avoided delays to the programme.

The inventory transfer was successfully completed in September 2015, achieving a substantial (over 50%) reduction in the risk posed by this legacy facility. In addition, the criticality risk has now been fully eliminated, greatly simplifying the future clean-up work. A key consequence of this is the targeting dewatering date for this facility is now more than 20 years sooner than in the baseline plan.

## **Implementing the Alternative ILW Approach**

A research project was initiated around four years ago to review the scientific understanding of ILW when stored in silos underwater. This work was in support of the planned waste management processes for materials retrieved from the Magnox Swarf Storage Silo, a legacy waste facility on the Sellafield site.

The direct outcome from the collaborative research was a breakthrough opportunity to greatly simplify downstream waste processing from a baseline 22 stages to just 3, whilst still meeting the essential criteria for waste management and interim storage, and with a view to final disposal.

The G6 engagement focussed on effective implementation of the new approach, which involved a number of complex aspects including government funding, commercial contracts, regulation and technical/operational elements.

As a result, alternative retrieval options for this very challenging waste can now be delivered significantly sooner than previously planned. Alongside the earlier start, the extensive delays associated with building the (highly complex) 22 stage waste processing plants have been avoided and overall project delivery risks have been significantly reduced. There have also been significant financial savings amounting to several hundred million pounds (see [www.nda.gov.uk/2015/10/research-breakthrough-to-accelerate-sellafield-decommissioning/](http://www.nda.gov.uk/2015/10/research-breakthrough-to-accelerate-sellafield-decommissioning/))

These achievements relied upon applying the G6 collaborative approach beyond the G6 organisations to include the Sellafield (technical support) supply chain. Building on this approach, the G6 is now conducting a wide-ranging review of additional, similar Waste Management opportunities that may become available in the future.

### **Managing Stocks of Highly Active Liquor (HAL)**

Highly Active Liquor arises from the reprocessing of irradiated nuclear fuels. Over many decades this topic has received significant regulatory attention at Sellafield reflecting the inherent levels of nuclear safety challenge needed for the safe and effective management of HAL.

The regulatory regime established limits and control on allowable stocks of HAL derived from spent nuclear fuel reprocessing. Given the lack of alternative fuel management strategies available for Magnox fuel – priority was always given to these arisings – with control therefore biased towards output from THORP (the Sellafield Thermal Oxide Reprocessing Plant).

The process of HAL stock reduction involves taking the HAL produced by reprocessing, concentrating it through evaporation and then through vitrification producing glass blocks of highly active waste. Since 2000, stocks of HAL at Sellafield have reduced by over 60% and the historic back-log of unprocessed HAL (the reason why ONR imposed regulatory limits) has been fully worked off.

In 2014, one of three vitrification facilities at Sellafield was subject to an extensive outage which reduced the processing capability and threatened compliance with regulatory limits. Sellafield Limited could have halted re-processing and so continued to meet the regulatory limits, but this would have necessitated halting parts of its RR&HR work.

Through collaborative working, an alternative set of operational controls was developed and agreed with ONR. Implementation of this approach ensured continued RR&HR (year on year stock reductions until bulk HAL removal is delivered in less than 10 years) while at the same time ensuring appropriate

regulatory controls over HAL stocks and facilitating the timely conclusion of fuel reprocessing activities at the site.

### **“Re-purposing” of existing waste management facilities**

An improvement plan to increase throughput and reliability of ILW encapsulation and storage facilities at Sellafield had been running for around two years. The initial goals of increased availability and capacity were met through rigorous application of a manufacturing ethos. As a direct result, the operating management at the facility have identified a number of opportunities to treat a wider spectrum of ILW, including some national priority legacy waste-streams.

Early benefits from these opportunities have already been delivered with the transfer to modern stores of some legacy ILW. However the potential to radically expand the envelope of acceptable waste feeds through modification to existing plant offers the potential for breakthrough thinking in the site’s approaches to waste management.

The G6 has been used to provide high level support to the initial concepts and to encourage a specific fit for purpose design, plant modification and regulatory approach to achieve the full potential that these may offer. Current considerations involve routing pond sludges from a legacy facility to an existing encapsulation plant for treatment alongside slurries arising from oxide reprocessing. It is envisaged that identical transfer packages will be used and a greatly simplified loading station for sludge is now being commissioned. This is saving time, capital investment and future operational costs – but crucially supporting the potential dewatering of one of the site’s legacy ponds two decades sooner than previously planned.

Additional significant benefits can be anticipated through earlier availability of ILW treatment of retrieved material from the site’s legacy silos.

The G6 will continue to “sponsor and encourage” this significant development.

### **COMMUNICATIONS**

Right from its inception, a key component of G6’s success has been a very strong focus on effective communications. The professional communicators from each of the organisations have regular discussions to co-ordinate communications (where appropriate) and to promote an up to date understanding of key issues and successes in addressing the national priority issues at Sellafield.

Sellafield Ltd for its own part has created a dedicated part of an internal web-site devoted to G6 activities. Routine Company briefings and publications also address G6 topics to “spread the word”.

The other constituent organisations have adopted similar approaches and an excellent example can be found on the ONR website ([www.ONR.org.uk](http://www.ONR.org.uk)).

A G6 Conference was held at Sellafield in June 2015 to review progress and highlight delivery successes and achievements. All six organisations took part with full commitment of senior leaders. Teams delivering real progress were able to demonstrate the benefits of the G6 ethos and provide information and encouragement to peers facing similar RR&HR delivery challenges. The Conference was very successful and plans are in-hand for a follow-on event.

Sharing and recognising achievement is at the heart of the G6 ethos. Accordingly "G6 Awards" were included as a category in the 2015 Sellafield Excellence Awards. Over 40 case studies and projects were submitted to the judging panel comprising senior staff from G6 organisations. Two teams were selected for special recognition.

During the recent IAEA Joint Convention on the Safety of Spent Fuel Management and on the Safety of Radioactive Waste Management Conference, the UK was recognised for its 'Good Practice' in how nuclear safety regulation is applied by ONR at Sellafield. The view of the Joint Convention meeting was that ONR's revised approach to Sellafield was innovative and accelerating RR&HR. The conference suggested that other IAEA Member States could adopt similar approaches to enabling regulation, centred on prioritisation, removal of barriers to progress and collaborative working between stakeholder organisations.

## **REGULATORY CONGRUENCE**

In April 2014 the Office for Nuclear Regulation (ONR) came into being as a Public Corporation. Its mission is: To provide efficient and effective regulation of the nuclear industry, holding it to account on behalf of the Public.

ONR's Number One Strategic Priority is 'Hazard reduction and remediation at Sellafield legacy facilities'.

As such, ONR has a regulatory strategy to support the delivery by Sellafield Ltd of its high hazard and risk remediation programmes focussing on securing accelerated safe and secure retrievals from legacy facilities.

For the first time in decades this progress is starting to happen with retrieved materials being moved into more modern storage at Sellafield. The success of ONR's regulatory approach is being achieved through collaborative working with key stakeholders, to influence and secure pragmatic solutions with due regard to proportionate regulation.

In seeking to deliver this outcome, ONR has established two complementary strands to its nuclear safety regulatory programme for Sellafield, which combine under a Deputy Chief Inspector. The collaborative working element, in essence "engaging and encouraging" so that Sellafield Limited meets its legal RR&HR

duties, is complemented by the familiar regulatory processes throughout industry including enforcement. Through this approach, which is integrated with ONR's other regulatory functions (nuclear security, conventional health and safety, radioactive transportation and materials safeguards) ONR is seeking to deliver three key outcomes.

- Accelerated hazard and risk reduction safety and security across the Sellafield site.
- Evidence-based confidence that Sellafield Limited is complying with its statutory obligations and that workers and the public are protected from the hazards of the site.
- Stakeholder confidence that ONR's regulatory approach is appropriately targeted, risk-based proportionate and effective.

Transparency is a vital element in security public confidence. Accordingly there is a substantial range of documents and reports relating to regulatory strategy, priorities, reports on interventions and enforcement readily available on the ONR website.

The effectiveness and efficiency of deployment of regulatory resources at Sellafield has been reviewed recently. As a result a more focussed pattern of routine regulatory engagement has been adopted by all regulators with an interest in Sellafield. This has already provided significant improvements in licencing administration and the improved availability of key staff to engage in collaborative working. This approach is welcomed by Sellafield Limited and is regarded as having a considerable positive effect on the conduct of normal business such that the expectation of greater efficiency is being delivered.

## **FUTURE GOALS AND CHALLENGES**

Risk continues to increase from Sellafield's ageing legacy facilities. Moreover, when retrieval interventions start (such as for sludges or other legacy radioactive materials) risks will increase still further. In the traditions of the nuclear industry significant provisions in terms of high quality engineering and safety devices are developed and implemented to address and seek to minimise such risk increases. In Sellafield's experience, this actually leads to project paralysis, delays and overall higher risks.

The collaborative approach under the G6 ethos acknowledges this reality and seeks to manage critical risks holistically and encourage early retrievals progress rather than endeavour minimise individual risks in a piecemeal fashion.

The challenge for the future is to sustain this collaborative working and encourage ongoing RR&HR as the technical demands of retrieving materials from legacy silos fall due. The realities of increased reliance on human performance



to make sustained progress will demand new approaches to operational management for Sellafield Limited and corresponding approaches from the other G6 members.

The clean-up programme at Sellafield remains a major, national priority for the UK Government, and a significant investment of public funds. Demonstrably effective use of this resource is important to all the G6 and other stakeholders.

## **CONCLUSION**

Effective collaborative working between the six key organisations that influence delivery of the hazard and risk reduction mission at Sellafield is bringing major successes. Real progress is being made in delivering a UK national priority.

It is clear that facilities elsewhere facing similar challenges could potentially benefit from this approach.